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EXAMINER	
SHINGLETON, MICHAEL B	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/792,167	RIBARICH ET AL.	
	Examiner	Art Unit	
	michael b. Shingleton	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, and 4-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Michael B Shingleton
MICHAEL B SHINGLETON
PRIMARY EXAMINER
GROUP ART UNIT 2817

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4, 5, 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segawa et al. US 6,456,170 (Segawa) in view of either Daisuke JP01157612 (Daisuke) and either Yasuda US 6,735,265 (Yasuda) or Alley et al. 4,734,650 (Alley).

Figures 11 and 22 along with the relevant text of Segawa discloses an adjustable oscillator circuit and method for providing a variable frequency signal by providing a timing capacitor 112, 122, an adjustable current source 113, 114, 123, 124 that is coupled to the capacitor for charging and discharging the capacitor at an adjustable rate. Segawa also clearly discloses a threshold circuit composed of at least elements 110, 111, 120 and 121 that is for changing a charging or discharging state of the capacitor based on the charge value of the capacitor and a threshold value VRH or VRL in the threshold circuit for comparison with the charge value of the capacitor to determine the change of the capacitor to determine the change of charging or discharging state (Note at least columns 4 and 5). Also note that elements 110, 111, 120 and 121 form at least one comparator that compares the threshold value to the capacitor charge value. Claims like claim 5 does not limit the invention to just a single comparator and can include a comparator that is formed from a plurality of comparators. Also as noted above the threshold value is actually two threshold values as meant by applicant (See Figure 1 and claim 7.). Accordingly, the threshold values VRH and VRL of Segawa is a "threshold value" that determines the two transition points where the charging stops and the discharging begins and where the discharging stops and the charging begins. Segawa is silent on the construction of the variable current sources as these are conventional current sources and specifically Segawa is silent on the construction of these variable current sources as including a switching element wherein a digital to analog converter is to provide the analog signal for the switching element.

Figures 1 and 2 of Daisuke clearly illustrates that a conventional variable current source composed of at least element 1 as shown the Figures 1 and 2 can be composed of a passive element 15

that is coupled to a switching element (The unmarked element directly connected between the diode-connected MOSFET and the resistor 15.). The passive element is for setting a "minimum" amount of current like that of element 16 of the disclosed invention of the instant application. The conventional current source of Daisuke also includes a current mirror that parallels the current mirror 18 of the claimed and disclosed invention of the instant application. It is also noted that both Segawa ad Daisuke lacks or is silent on the source of the voltage that controls the frequency of the VCO (The voltage "Vin" in Segawa and "V" in Daisuke.).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the conventional variable current source(s) of Segawa with that of Daisuke because as the Segawa reference is silent on the exact structure of these current sources and shows these current sources as conventional current sources in Figures 11 and 22 one of ordinary skill in the art would have been motivated to use any art-recognized equivalent variable current source such as the conventional variable current source as disclosed by Daisuke.

As to the digital control mentioned above, the voltage "Vin" in Segawa is assumed to be an analog signal. However, digital controls are conventionally very well known in the art for setting an analog value in a VCO. These digital controls include a digital to analog converter. In response to applicant's challenge to provide a reference showing the well-known nature of this fact, the examiner has cited two references. The Yasuda reference utilizes a digital phase comparator as part of the digital control and the output of such is supplied to a digital to analog converter 16 that is applied to the input of a VCO. This allows a digital signal to vary the voltage applied to the VCO and hence it allows the digital signal to vary the frequency. Alley also shows that a digital signal can be used through a digital to analog converter to control the output frequency of a VCO. Here a microprocessor is provided as part of the digital control to provide the digital signal to the digital to analog 51 that outputs an analog signal to a VCO 53 that is utilized ultimately in a ballast circuit to control the dimming state of the ballast.

Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a digital to analog converter to come up with the analog signal Vin in Segawa so as to allow for the use of digital control for the VCO as is taught by both Yasuda and Alley.

Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segawa, Daisuke, Alley and Yasuda as applied to claims 1, 4, 5, 8 and 11 above, and further in view of Ouyang et al. 4,692,717 Ouyang.

Segawa as applied above and the following: As noted above the claims like claim 1 do not

exclude the comparator from being composed of a plurality of comparators. However, a fair and reasonable reading of claims 6 and 9 includes the use of a single comparator that excludes the comparator from being composed of a plurality of comparators wherein a switch that can be composed of switches like elements 28 and 32 of the instant application is used to switch the high and low voltage reference signals to the negative input of the single comparator.

Such a structure as indicated above is also conventional. Note elements 16, 64 and 66 of Ouyang. It is clearly apparent from Ouyang that one advantage to using such an arrangement is that only one comparator is required. It is simply an art-recognized equivalent way to sense the when the high and low levels are exceeded to control the charging and discharging of a timing capacitor in an oscillator.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the two comparator structure of Segawa with a signal comparator element with the high and low reference signals of sources being switched to the negative input of the comparator so as to reduce the number of comparators as taught by Ouyang. One of ordinary skill would have been additionally motivated to make the combination given the art-recognized equivalence of these two structures.

Claims 1, 4, 5, 7, 8, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alley et al. 4,734,650 (Alley) in view of Segawa 6,456,170 (Segawa) and Daisuke JP01157612 (Daisuke).

Figures 1, 3 and 6 along with the relevant text of Alley discloses an electronic ballast that includes a D/A converter 51, and a VCO 53 that forms part of a ballast control circuit for the ballast circuit. Alley recites that various VCO structures can make up the VCO. Column 5, around line 59 of Alley specifically recites that the VCO "may comprise" the VFC 320 VCO from Burr Brown of Tucson, AZ.

One VCO structure within the level of ordinary skill is the one made obvious by Segawa in view of Daisuke. Here Segawa discloses in Figures 11 and 22 along with the relevant text a variable or adjustable frequency oscillator. Elements 112 and 122 of Segawa provide a timing capacitor like that of element 20 of the disclosed invention. Elements 113, 114, 123, 124 provide a adjustable current source structure that is coupled to the timing capacitor and is provided for charging and discharging the timing capacitor at an adjustable rate just like the current source 18 and the unmarked marked current source directly between elements 22 and 26 of the disclosed invention charges and discharges the capacitor 20. Segawa also clearly discloses a threshold circuit composed of at least elements 110, 111, 120 and 121. This threshold circuit is for changing a charging and discharging state of the timing capacitor based on the

charge value of the capacitor and a threshold value VRH or VRL in the threshold circuit for comparison with the charge value of he capacitor to determine the charge of the timing capacitor, i.e. is the capacitor charging or discharging (Note at least columns 4 and 5 of Segawa.) Note that claims like claim 7 recites "a threshold value comprises a first and second threshold value(sic)". Thus the thresholds VRH and VRL are considered to be a threshold value as meant by applicant. These threshold values clearly determine a transition point between one of charging and discharging and a transition point between one of discharging and charging. Segawa is silent on the exact structure of the adjustable current sources 113 and 123.

Figures 1 and 2 of Daisuke clearly illustrates that a conventional variable current source that is composed of at least element 1 can be composed of a passive element 15 that is coupled to a switching element (The unmarked element directly connected between the diode-connected MOSFET and the resistor 15.) The passive element 15 is for setting a "minimum" amount of current like that of element 16 of the disclosed invention. The switching element clearly varies the current of the variable current source. Note also that the conventional current source of Daisuke also includes a current mirror structure generally pointed to by number 11 in Figure 2 of Daisuke. Such a current mirror structure parallels the current mirror 18 of the claimed and disclosed invention.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the conventional variable current sources 113 and 123 of Segawa with that of Daisuke because as the Segawa reference is silent on the exact structure of these current sources one of ordinary skill in the art would have been motivated to use any art-recognized equivalent variable current source such as the conventional variable current source disclosed by Daisuke.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the VCO structure 53 of Alley with a that taught by Segawa and Daisuke as noted above because as the Alley reference recognizes that other VCOs can make up the VCO structure one of ordinary skill would have been motivated to utilize any art-recognized equivalence structure such as the VCO structure made obvious by Segawa and Daisuke.

With respect to newly presented method as presented in the amended claim 11, here the structure made obvious above is for charging and discharging a capacitor (112 or 122 in Segawa) at a selected rate determined by the switch (The unmarked switch referred to in Daisuke.). The comparator structure of Segawa of the combination made obvious above determines whether the capacitor charge value reaches a predefined value thereby changing the charging or discharging of the timing capacitor. The controlling the selected rate with a digital value is provided by the digital to analog converter whose analog value

output is applied to the switching element of the variable current source that varies the current supplied to the timing capacitor.

Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alley in view of Segawa and Daisuke as applied to claims 1, 4, 5, 7, 8, 10 and 11 above, and further in view of Ouyang et al. 4,692,717 Ouyang.

Segawa as applied above and the following: The base claims like claims 1, 4, 5, 7, 8, 10 and 11 do not exclude the comparator from being composed of a plurality of comparators. However, a fair and reasonable reading of claims 6 and 9 includes the use of a single comparator that excludes the comparator from being composed of a plurality of comparators wherein a switch that can be composed of switches like elements 28 and 32 of the instant application is used to switch the high and low voltage reference signals to the negative input of the single comparator.

Such a structure as indicated above is also conventional. Note elements 16, 64 and 66 of Ouyang. It is clearly apparent from Ouyang that one advantage to using such an arrangement is that only one comparator is required. It is simply an art-recognized equivalent way to sense the when the high and low levels are exceeded to control the charging and discharging of a timing capacitor in an oscillator.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the two comparator structure of Alley, Segawa and Daisuke with a signal comparator element with the high and low reference signals of sources being switched to the negative input of the comparator so as to reduce the number of comparators as taught by Ouyang. One of ordinary skill would have been additionally motivated to make the combination given the art-recognized equivalence of these two structures.

Response to Arguments

Applicant's arguments filed 12-27-2005 have been fully considered but they are not persuasive.

Applicant states that "Figure 1 of Daisuke, however, does not appear to include an element 15". The conventional variable current source of Daisuke also has an element "9" both in Figures 1 and 2 and the expanded showing of element 9 in Figure 2 clearly has element 9 as including a resistor 15. Thus Figure 1 of Daisuke does include element 15. From the examiner's copy of the Daisuke reference it appears that the dotted box in the Figure 2 illustration refers to "1", however, the examiner pointed to the other elements that is to make up the conventional variable current source like the current mirror as shown in Figure 2 of Daisuke. The record is clear that the V/I converter and the transistor 11 are all part

of the conventional variable current source. To say that it is impossible to tell exactly what the relationship is between Figures 1 and 2 is not correct. One can see in the Figures themselves certain relationships like Figure 1 and 2 both have the elements "5" and "9". Applicant remarks that the examiner has provided no translation. While it is true that a translation is not presently of record in the instant application (The examiner did not have a translation available at the time of the office action.), the examiner contends that such a translation is not needed or required. **If applicant has a translation available, the examiner respectfully requests that applicant provide a copy of such to the examiner so that it can be made a part of the record.** In the Daisuke there is sufficient English present in the reference like the showing of the element "V/I" where one would have clearly recognized this as a voltage-to-current converter and the use of conventional universally accepted circuit symbols present that there is no confusion as to what is shown and described. In other words the drawings themselves clearly set forth the structure and operation of the circuit due to the use of symbols utilized therein that are commonly known circuit symbols used throughout the world. For example the current mirror structure shown in Daisuke is also easily recognized by those in the art. The current flowing through the diode-connected transistor will be mirrored in the transistor 11. Also the function of setting a "minimum" current would have also been easily recognized by those of routine skill in the art because of the use of the resistor 15. This is in accordance with Ohms law. Note that if the diode-connected transistor and the unmarked transistor connected directly between the diode-connected transistor and the resistor 15 as illustrated by Figure 2 of Daisuke the were shorts then the "maximum" amount of current flow would be set by the resistance of the resistor. Applicant refers to this as the "minimum amount of current received by capacitor 20 may be set by selecting an appropriate resistance value for the resistor 16, thereby the minimum charge time". However, no confusion is present when the claims are read in light of the specification and given the identical nature of the variable current source of applicant's invention and that of the prior art, applicant is clearly not relying in these features of the variable current source for patentability. In order to get the minimum charge time of a capacitor the maximum amount of charging current must be provided. In other words a trickle charge of current will cause the capacitor to take a long time to charge whereas a current charge much greater than a trickle charge will charge the capacitor in the shortest time. Applicant further states "Daisuke does not appear to provide any teaching or suggestion as to why one may be motivated to utilize the current source in the oscillator circuit of Segawa et al.". In response to applicant's arguments applicant arguments are against the references individually and one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck &*

Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It was the combination of the references that the rejection was based upon and the rejection is clear that it is because the Segawa reference is silent on the exact structure of the current sources that one of ordinary skill would have been motivated to use any art-recognized equivalent variable current source such as the one disclosed by Daisuke. Art-recognized equivalence is a proper motivation to combine (See MPEP 2144.07). Applicant does not dispute that the Daisuke fails to show an art-recognized equivalent form of a variable current source. From the drawings of Daisuke one can ascertain that Daisuke discloses a variable current source. The mere fact that Segawa is silent on the exact structure of the variable current sources shows that various conventional current sources can be employed therefore and provides additional motivation to employ art-recognized equivalent conventional current sources. The disclosure of a US Patent is assumed to be enabled and are presumed valid 35 USC 282 and thus the variable current source of Segawa must include a large variety of known variable current sources.

Applicant argues that a reference was not cited for showing the D/A converter that was the subject matter of dependent claims like originally presented claim 3. The examiner contends that the use of D/A converter to provide an analog signal from a digital control signal and even to utilize a microprocessor to provide the digital signal is so old and well-known that this would have been capable of instant and unquestionable demonstration as being well-known. (See MPEP 2144.03) As recited above this subject matter of providing a D/A converter was in the dependent claim where this subject matter was not being used to base the patentability of the independent claims on when the original application was filed. As stated in MPEP 2144.03 "Furthermore, it might not be unreasonable for the examiner in a first Office action to take official notice of facts by asserting that certain limitations in a dependent claim are old and well known expedients in the art without the support of documentary evidence provided the facts so noticed are of notorious character and serve only to "fill in the gaps" which might exist in the evidentiary showing made by the examiner to support a particular ground of rejection." Original claim 3 recited a D/A converter to provide the analog signal to the control element, i.e. switch. Official Notice was took to "fill in the gaps" because the use of a digital signal to provide an analog signal and the use of digital control over that of analog is so very well-known that it is capable of such instant and unquestionable demonstration. The examiner would have never thought that the applicant would question such a conventionally known fact. The use of a digital arrangement over an analog have advantages that are conventionally known in the art so as to take advantage of things like better signal to noise ratios a digital signal offers over an analog signal.

However, in response to applicant's challenge to provide a reference in support of the examiner's position, the examiner has now cited Yasuda 6,735,265 and Alley et al. 4,734,650 references. Both show that the use of a D/A converter to allow the use of digital signal to provide the analog signal to a VCO is very well known in the art.

Claim 10 now includes subject matter never before claimed and that is an adjustable oscillator with a D/A converter in an electronic ballast control circuit. However, the examiner contends that even with this subject matter the use of a D/A converter to convert a digital control signal to an analog signal that is applied to VCO in a ballast circuit that powers a gas discharge lamp is an old and well-known expedient. In support of this the examiner has provided an "instant and unquestionable demonstration as being well known" by the citation of the Alley et al. 4,734,650 reference. This amendment necessitated the new ground of rejection with respect to at least claim 10, however, this new rejection of claim 10 will also cover claims like amended claim 1. Accordingly, the examiner had no choice but to include these claims in the rejections necessitated by the amendment. Also note that the method claim 11 has been amended to present method never before claimed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal, can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306 and after July 15, 2005 the fax number will be 571-273-8300. Note that old fax number (703-872-9306) will be service until September 15, 2005.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS
March 20, 2006

Michael B Shingleton
Primary Examiner
Group Art Unit 2817